

Quick and easy parametric review:

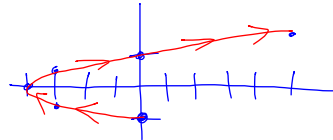
$$\begin{array}{lll} t = \text{parameter} & x = f(t) & \text{parametric} \\ & y = g(t) & \text{equations} \end{array}$$

Points $(f(t), g(t))$ are plotted in the xy plane for increasing values of t .

Ex:

t	-2	-1	0	1	2	3
x	0	-3	-4	-3	0	5
y	-1	$-\frac{1}{2}$	0	$\frac{1}{2}$	1	$\frac{3}{2}$

for $x = t^2 - 4$ $y = \frac{1}{2}t$
on $-2 \leq t \leq 3$



★ Notice y is NOT a function of x , but both x & y are functions of t .

$$\begin{array}{l} \text{for } x = f(t) \\ y = g(t) \end{array} \quad \frac{dy}{dx} = \frac{\frac{dy}{dt}}{\frac{dx}{dt}} = \frac{g'(t)}{f'(t)}$$

Example MC Question

An object moves in the xy plane so that its position at time t is given by the parametric equations. Find the rate of change, $\frac{dy}{dx}$ when $t = 3$.

$$x(t) = t^3 - 3t^2 + 2 \quad y(t) = \sqrt{t^2 + 16}$$

A) $\frac{1}{90}$

B) $\frac{1}{15}$

C) $\frac{3}{5}$

D) $\frac{5}{2}$